Henry Skinner

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ENTOMOLOGICAL NEWS

AND

PROCEEDINGS OF THE ENTOMOLOGICAL SECTION

THE ACADEMY OF NATURAL SCIENCES OF PHILADELPHIA

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A New Species of an Achias-like Fly from Nicaragua, apparently belonging to the little-known genus Plagiocephalus (Diptera : Ortalidae).

By E. T. CRESSON, JR.

Among the material collected by Mr. Wharton Huber on the Nicaraguan Expedition of the Academy of Natural Sciences of Philadelphia, in the spring of 1922, was found a specimen of the curious pseudo-stalked-eyed flies, which upon close examination proved to be quite distinct from *Achias* and its allies. An examination of the literature relative to species of *Achias* soon established the similarity of this fly to the figure

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of *Plagiocephalus lobularis,* given in Wiedemann's 1830 paper. That species was the only known *Achias*-like dipteron, excepting some species of the drosophilid genus *Zygothrica* occurring in the New World, which fact makes the finding of the present species all the more interesting. I give below a rather full description, in absent of detailed illustrations, endeavoring to include all characteristics of specific and generic importance.

PLAGIOCEPHALUS Wied.

1830. Wiedemann, Achias, 12. pl. ii, f. 1a-b.
1843. Macquart, Dipt. Exot., ii (3), 213.
1873. Loew, Mon, Dipt. N. A. iii, 26.
1880. Osten-Sacken, An. Mus. Civ. St. Genova, xvi, 478.
1909. Hendel, Gen. Ins., fasc. 96, 47.
1911. Hendel, Gen. Ins., fasc. 113, 52.

This genus was erected for *Achias lobularis* Wied., a well marked species described from Brazil, but which apparently has not been seen since its discovery. Consequently, and in part owing to the insufficiently characterized description, the position of the genus has been little understood. Prior to Loew's and Osten Sacken's papers above cited, the genus had been associated with *Achias,* but Hendel following their suggestions, placed it in the ortalid subfamily Richardinae.

That the present species is closely related to *lobularis* is certain, but I have doubts as to it being congeneric. The fact that it has a distinctly plumose arista (that of *lobularis* being bare) alone suggests generic distinction and, furthermore, this may be substantiated by other characteristics not mentioned in the descriptions of *lobularis.* However, in the absence of more knowledge of *lobularis,* I hesitate to erect another genus for the present species. The pedal structure and the venation of *lobularis* may offer some valid generic characteristics, but one is guided only by the general figure of that species in these respects.

That the present species is a member of the Richardinae, is evident by the following characteristics: Vibrissa absent; median part of face flattened with a distinct transverse sulcus above the projecting epistoma; sutural impressions of mesonotum oblique; two pairs of post-dorso-centrals; mesopleural bristles well de-

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veloped, but there are no propleurals nor sternopleural. Auxillary vein entering costa slightly beyond branch of second and third veins, at which point the first vein is thickened and nearly contiguous with the auxillary vein; first vein short and bare; anal cell short with its cross-vein convex, without acute lower angle. Abdomen rather slender basally.

Plagiocephalus huberi new species

Yellow; third antennal segment above, a transverse stripe on head above from eye to eye, including frontal bristles and ocellar tubercle, a similar stripe on occiput from eye to neck, including inner and outer verticals, brown. Mesonotum dark brown to black, opaque, marked with golden pollinose design as follows: a broad median stripe extending nearly to base of scutellum, then laterally, including postalar callus, then anteriorly, emarginated at suture and including humerus. There is also a vertical golden stripe over mesopleura but not including the shining sternopleura, a spot of same color on metapleura and a stripe below halteres. Scutellum sordid, sparingly golden pollinose. Metanotum dark with median pale vertical stripe. Pleura pale with dark vertical stripe behind prostigma and another before poststigma. Halteres nearly white. Abdomen (much shrunken and deformed) is dark with first segment and a median stripe on second and third, also lateral apical angles of second, pale. Legs entirely yellow but apices of tarsi darker. Wings yellow with pale veins immaculate but faintly longitudinally infuscated in first posterior cell.

Structurally, in general habitus, similar to Wiedemann's figure, but the head more slender as in Macquart's figure. Ocelli well developed, bristles strong and parallel and situated behind line of anterior ocellus; post-verticals divergent; inner verticals situated slightly beyond line of humeri, while the outer verticals are about midway between the former and the eyes; one frontal situated slightly beyond line of inner verticals; all these bristles well developed. Lunular margin straight, distinct to eyes where it becomes carinate, and the eyes are angular at that place. Antennae close together; third segment three times as long as second, and three times as long as broad, rounded apically; arista longer than third segment, shortly but distinctly plumose to tip. Face subopaque, medianly flattened; facialia produced laterally in form of a triangle, evanescing slightly beyond line of frontal bristle; no vibrissae or setulae on face. Epistoma concave, narrow but prominent, with a distinct transverse sulcus above; clypeus narrow, short, not as broad as the oral opening. Proboscis short; palpi broadly scapulate apically.

Thorax robust, as broad as long; fore coxae not attaining base of middle ones; all bristles strong. Mesonotum yellow setulose; two post-

dorso-centrals; two post-alars; one supra-alar; one presutural; one humeral; two noto-pleurals; one meso-pleural, and some pale hairs on the posterior margin and on the golden stripe. Scutellum triangular, flattened, with two diverging apical and one lateral bristles. Legs rather robust, especially hind femora. Fore legs without dorsal bristles, but with pale hairs; middle femora with few short flexor bristles and a preapical on tibiae; hind femora thickened, with stout flexor spines and several slender extensor bristles, without preapical on tibiae. Squama-thoracalis linear; squama-alaris small with long pale cilia.

Abdomen much shrunken and impossible of critical description.

Wings 8 mm. long. Costal cell narrow; auxiliary vein entering costa at break; no costal spine; stigmal area short; first vein bare, short, ending far before line of ante-cross-vein; second vein long; second costal section about three times as long as third. Third and fourth veins bare, converging so that first posterior cell is considerably narrowed apically; ante-cross-vein perpendicular, beyond middle of discal cell; ultimate section of fourth vein three times as long as preceding section; post-cross-vein straight, perpendicular; anal cell not longer than second basal, and its cross-vein convex, rounding into sixth vein. Alula moderate. Length.—8 mm. width of head 10 mm.

Type.— ♂ ? Eden, Nicaragua, 14°-0′N., 84°-26′ W., May 17, 1922, (Wharton Huber, [A. N. S. P., No. 6284.]

An Interesting New Species of the Genus Melanoplus from Central Georgia (Orthoptera, Acrididae).

By Morgan Hebard, Philadelphia, Pennsylvania.

In June of the present year, Dr. Henry Fox, for the first time, examined a small upland grove, three miles east of Macon, Georgia, and about a mile north of a spot locally known as "Cross-Keys." He there secured eight specimens of a short-winged member of the genus *Melanoplus*, which represent a previously unknown species. This insect is described below and we take great pleasure in naming it in honor of Dr. Fox, whose observations and studies in the Orthoptera show a thoroughness, accuracy and scientific concept which places them with the most important contemporary contributions.

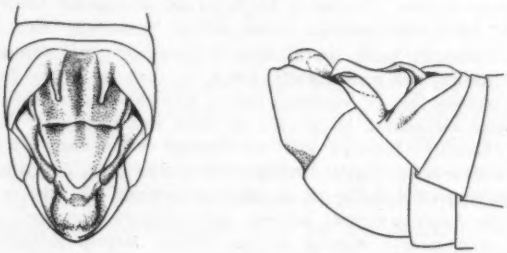
Melanoplus foxi new species. Text figures 1 and 2.

This insect is nearest *M. strumosus* Morse, being one of the species of the Puer Group having broadly oval tegmina, dull glaucous caudal tibiae and a truncate prosternal spine. Further agreement with *strumosus* is found in the general form, the

male cerci and subgenital plate being of the same general type, though showing striking differentiation. Superficially, the attingent tegmina give to the present insect a slightly stronger resemblance to *M. scapularis* Rehn and Hebard.

From *strumosus,* males of *foxi* are readily separated by the attigent tegmina, more slender furcula, which are separated at their bases by a considerable interval, much more elongate supra-anal plate, showing a different contour, particularly in the sharp transverse carina mesad, cerci straighter and slightly surpassing the apex of the supra-anal plate and similarly broadly truncate subgenital plate, which, however, is proportionately decidedly shorter.

Type: ♂ ; Macon, Georgia. June 4, 1923. (Dr. Henry Fox.) [Hebard Collection, Type No. 924.]



Melanoplus foxi n. sp. Dorsal (1) and lateral (2) views of apex of abdomen of male type. (Much enlarged).

Size and form closely resembling *strumosus,* very slightly less robust. Weak sulcation of vertex and frontal costa similar. Eye considerably longer than cheek, distinctly more than twice as long as infra-ocular sulcus. Pronotum with lateral carinae of disk not well defined, very feebly diverging caudad; medio-longitudinal carina percurrent, sharp and distinct; caudal margin of disk very weakly convex, however, very faintly less truncate than in *strumosus.* Tegmina abbreviate rotundate, not much longer than broad, very slightly overlapping. Extremity of abdomen moderately tumid and slightly upcurved. Furcula represented by a pair of slender, finger-like processes, parallel (or feebly diverging) and separated at their bases by a distance slightly less than the length of one of these. Supra-anal plate elongate shield-shaped, one and one-half times as long as greatest width; proximal half with a broad and decidedly concave medio-longitudinal sulcus and lateral

portions even more strongly concave, separated from distal portion by a sharp transverse carina; distal half showing concavity proximad on each side, its lateral margins weakly emarginate before the angulate apex. Cerci broad proximad but rapidly tapering, produced as a slender shaft, which is straight in lateral aspect but feebly incurved in dorsal aspect, its apical portion slightly thickened and produced to an acute point directed ventro-caudad. Subgenital plate broadly truncate-conical, longer than cercus but much shorter than supra-anal plate. Limbs as in *strumosus*.

The measurements of the type are given first. ♂. Length of body 16 and 15.8, length of pronotum 4 and 3.9, caudal width of pronotal disk 2.8 and 2.8, length of tegmen 3.6 and 3.3, width of tegmen 2.8 and 2.7, length of caudal femur 10.7 and 10.8 mm.

The most noteworthy color differences found between this insect and *strumosus* are the more reddish shade and apparently less strikingly paler face, genae and ventral portion of the pronotal lateral lobes of *foxi*. Vertex, occiput, disk of pronotum and tegmina blackish chestnut brown. A shining black, broad post-ocular bar extends from the eye to the principal sulcus of the pronotum. Eyes russet. Other portions of head, lateral lobes of pronotum and ventral portions of pleura vinaceous russet. Other portions of pleura blackish, with an oblique line of vinaceous-pink. Abdomen pecan brown, with an abruptly terminated black area on each side proximad. Ventral surface chamois. Cephalic and and median limbs vinaceous russet mottled with brown. Caudal femora mikado brown, the genicular areas and three transverse suffusions of blackish forming the usual external pattern, the ventro-external portion light pinkish cinnamon; ventral surface clear tawny, internal surface dorsad largely suffused with blackish. Caudal tibiae very dull glaucous-blue, spines black, spurs buffy with black tips.

Two paratypic males and five large immature individuals, representing both sexes, were also secured. Dr. Fox writes that "they were found in scrubby undergrowth, consisting predominantly of huckleberry, deerberry (*Polycodium sp.*), brake (*Pteridium aquilinum*) and oak sprouts (mostly *Quercus cinerea*, the upland willow oak), in an open grove of mixed longleaf pine and scrub oak. The locality is on nearly level upland, in the section known as the Sand Hills, a few miles below the 'Fall Line.' More than an hour's search was required to secure this small series. The insects appeared to be rather sluggish, leaping and then clinging to some twig or other convenient support, in much the same manner as other brachypterous forms."

Some Peculiarities of the Dragonfly Fauna of Trinidad (Odonata).

By E. B. WILLIAMSON, Bluffton, Indiana.

Trinidad, in latitude between 10° and 11° north, with an area of about 2050 square miles, lies sixteen miles east of the northeastern extremity of Venezuela, its northern coast line on about the same parallel as that of the mainland lying west of it. To the south lies the delta of the Orinoco, whose southern affluents, together with the coastal streams of the Guianas to the southeast, rise from the highlands which are the northern watershed of the lower Amazon. The topography of Trinidad is varied, rising from sea level to a maximum at a few points of about 3000 feet. The flora is rich and generally luxuriant.

In 1912 with my father, L. A. Williamson, and Mr. B. J. Rainey, I made a small collection of dragonflies in Trinidad. This collection has not been fully worked up, but Dr. Ris has published on the Libellulines and I have recorded some of the Agrionines. These records in connection with the known distribution of dragonflies in northern Venezuela and Colombia and Central America, on the one hand, and in British Guiana and the lower Amazonian basin on the other, present some points of interest which students of other groups of the fauna of Trinidad may find significant. My first hand knowledge of the lower Amazonian dragonflies is based almost entirely on a very large and complete collection made by J. H. Williamson and J. W. Strohm, under the auspices of the University of Michigan, which collection is now being studied by J. H. Williamson and myself.

This note on the dragonflies of Trinidad is brief and general and it is not my purpose to discuss the distribution of any species in detail. So the region lying west and north of Trinidad, as mentioned in the preceding paragraph, will be referred to as *western,* while the Guianian and Amazonian regions will be referred to as *southern* when these regions are compared with Trinidad.

Dr. Ris records forty species of Libellulines from Trinidad, based on our collections. Of these one is insular, but not confined to Trinidad; twenty-six occur in both the southern and western regions; ten occur in the southern only; and three occur only in the western. Thus the predominance of the southern species, in view of the geographical position of Trinidad, is striking and rather unexpected. The three western species belong to two genera, *Dythemis* and *Macrothemis,* and are stream-frequenting species, but there are other species in Trinidad of these genera which occur in both the western and southern regions or in the southern region only.

Two genera of protoneurines with a single species of each occur in Trinidad. These two species occur only in the western region. They are stream species. None of the species of protoneurines of the southern region is known from Trinidad.

In the same way two species of *Hetaerina,* like all the species of the genus, stream dwellers, occur only in the western region, none of the numerous species of the southern region being known from Trinidad.

At a little woodland swamp near Cumuto, in Trinidad, we took three species of *Metaleptobasis.* Species of this genus frequent small woodland swamps, swampy forests, subject to seasonal inundation, and similar habitats found about sluggish, muddy, wet-weather woodland streams. They are inconspicuous insects usually resting near the ground on twigs or the upturned edges of fallen leaves or in grass or sedge clumps and sometimes rising to higher perches in bushes or low trees. Their flight is usually direct and rapid but for short distances only. The distribution of the three species found in Trinidad is exactly the opposite of what we find in the case of the stream dwelling protoneurines and Hetaerinas. For the three *Metaleptobasis* are all southern. One is known from British Guiana, another is known from far up the Madeira River, about as far south of the equator as Trinidad is north, and the third species is known also from far up the Madeira and from Manáos and Pará. The genus is known from the western region but none of the western species is known to occur in Trinidad.

Lacking a knowledge of the geology of Trinidad and such light as data on floral or other faunal groups may throw on these facts, I may yet hazard in a very diffident way a theory to account for the present dragonfly fauna. We may suppose the *Metaleptobasis* are members of a very old fauna, present when Trinidad was a part of the Guianian land mass or directly connected therewith. During the time of separation the stream faunas became extinct from some reason or, if they survived, they were later replaced by an invasion of better adapted stream species from a contiguous region of similar geographical position and similar climatic conditions, that is, from northeastern Venezuela.

[The following data bearing on the theory proposed by Mr. Williamson are added at his request. F. M. Chapman (Bull. Amer. Mus. Nat. Hist. VI, p.7, 1894) lists 194 species of land birds common to Trinidad and the continent of South America. Of these: 153 are found in both Guiana and Venezuela, 25 in Venezuela but not in Guiana, 11 in Guiana but not in Venezuela. He holds that the Trinidad avifauna "belongs in the Colombian rather than in the Amazonian subregion." He does not consider the relations of parts of Trinidad separately. R. T. Hill (Bull. Mus. Comp. Zool. XXXIV, 1899) thinks that "Trinidad, Tobago and the adjacent islands were severed from the South American coast" in late Miocene and Pliocene time (p. 214). "The continental coastal plains of South Florida, Mexico, Yucatan, Costa Rica and Trinidad were veneered during Pliocene time with a coating of oceanic debris composed of shells and calcareous muds" (p. 217). Wheeler (Amer. Mus. Novitates, No. 45, New York, Sept. 7, 1922, p. 1) says: "the ant fauna of Trinidad . . . is in great part identical with and probably quite as rich as that of the adjacent Venezuelan coast."—EDITOR.]

Collecting in the Southwestern United States.

DEAR DR. SKINNER: I am making a belated and hurried collecting trip through the Southwest—Texas, Arizona, and California. On arriving here, was fortunate in getting the services of a U. S. Forest Ranger (on vacation) and his Ford auto. Have been into the Catalinas at various points to 6000-7000 feet; the Santa Ritas, east and west slopes; the Huachucas (Carr and Ramsey canyons); Nogales, Patagonia, and other points, I looked principally for *Psychidae*, but have a lot of other material including *Megathymus* and other interesting diurnals. Saw Biederman in Carr Canyon, and the Magny brothers, just below him. Didn't find your big *Psychid*, which has apparently disappeared from the station for it. Barnes has it, I believe, from elsewhere. I've picked up some flies for Mr. Cresson, and some dragon flies for Dr. Calvert. Shall hope to tell you about my Huachuca experiences soon after my return in late October.

Yours very truly,

FRANK M. JONES, Wilmington, Delaware.

New Tachinidae from Texas (Diptera).

By H. J. REINHARD, Texas Experiment Station, College Station, Texas.

PARATACTA new genus.

Related to *Atacta* Schiner. Abdomen, thorax and head with distinct macrochaetae. Palpi well developed, proboscis slender, shorter than height of head. First vein bare, sides of face with bristly hairs on the lower half, apical cell open, ending well before wing tip. Eyes bare. Front of male greatly narrowed above, about equal to one-half the width of either eye, in female one and one-half times as wide as either eye. Ocellar bristles present, proclinate. Lowest frontal bristles about opposite the middle of second antennal joint. Antennae reaching to lower third of face, vibrissae rather weak, somewhat approximated, situated less than one-half the length of second antennal joint above oral margin. Facial ridges practically bare, only one or two bristles at the base above the vibrissae. Cheeks in the female about one-third, in the male one-fourth, as wide as eye height. Wings of normal shape, whitish hyaline, costal spine obsolete. Hind tibiae ciliate on the post-exterior edge. Type of genus, *Paratacta facialis* new species.

Paratacta facialis new species.

♀. Black, the first two antennal joints, palpi, scutellum and fourth abdominal segment, except at its base, yellow. Frontal bristles diverging abruptly at base of antennae, cruciate, except the vertical pair. Two pairs of orbitals, and a pair of posteriorly directed macrochaetae situated outside of the frontal rows about mid-way between the hind pair of orbitals and the anterior ocellus. Inner and outer verticals strongly developed. Antennae separated at base by a carina, third joint black, except at base, slightly shorter than second. Arista bare, thickened on basal third, the penultimate joint slightly longer than broad. Sides of face at narrowest part nearly one-third as wide as median depression, bearing several irregular rows of bristly hairs extending from the lowest frontals nearly to lower end of the eyes. Proboscis moderately long, distal segment rigid, shining black, labella fleshy, yellowish; palpi spatulate.

Thorax gray pollinose, dorsum with five black vittae. Three postsutural dorsocentral and four sternopleural macrochaetae. Scutellum gray pollinose, with three pairs of long marginal macrochaetae and a smaller discal pair, dorsum covered with sub-erect bristly hairs.

Abdomen short, broad, gray pollinose, clothed with coarse reclinate bristles, all macrochaetae marginal, large and erect. The first two segments with the usual pairs, third with a marginal row and the fourth with a submarginal row.

Legs black, knees yellowish, middle tibiae with three macrochaetae on the front side near the middle, pulvilli short.

Wings whitish hyaline, veins yellow, all except third bare, the latter with two or three bristles at the base. Hind cross vein nearly straight, nearer to bend of fourth than to small crossvein. Apical cell open, ending distinctly before wing tip. Bend of fourth vein rounded, without a stump or fold. Calypteres whitish, tinged with yellow.

Total length 7 mm.

♂. Similar to female except as noted in the generic description and as follows: Parafrontals with numerous long slender black hairs, no orbital or outer vertical bristles present, third antennal joint as long as second. Eyes larger and the facets on the upper half enlarged.

Described from one male and one female specimen, the former not perfect. Collected at Balmorhea, Texas, August 4, 1922. (C. S. Rude). *Type*, a female, deposited in the U. S. National Museum, Washington, D. C. This species differs from *Atacta* principally in having the parafacials hairy, and is generally much less robust.

Xiphomyia texana new species.

♀. Length 6 to 7 mm. Eyes bare. Front nearly as wide as either eye, faintly yellow pollinose, except on the outer borders, vitta broad, occupying about one-third the width of the front, opaque, brownish-black. Ocellar triangle yellow pollinose, with numerous short black hairs, and a pair of weak proclinate bristles. Two pairs of orbital bristles. Frontals in two rows, directed posteriorly and descending slightly below the base of third antennal segment. Parafacials, cheeks, and median depression cinereous. Antennae nearly as long as face, black, third joint slightly more than twice as long as second. Arista black, thickened only for a short distance beyond the base, microscopically pubescent on less than basal half, penultimate joint not longer than broad. Facial depression rather large, ridges diverging strongly downward, bearing four or five bristles above the vibrissae. The latter large and strongly cruciate, situated on level with the oral margin and lower end of the eyes. Sides of the face bare and narrow. Proboscis short, labella fleshy, yellowish; palpi brownish at base, yellow apically. Cheeks narrow, about one-fifth as wide as eye height. Posterior orbits and occiput cinereous.

Thorax black, the pollen on dorsum tinged lightly with yellow, four distinct vittae, the outer pair broad and interrupted at suture, pleurae

thinly gray pollinose. Four postsutural dorsocentral and three sternopleural macrochaetae. Scutellum black, bearing three pairs of marginal macrochaetae, the posterior pair extending almost to base of third abdominal segment, the apical pair small or obsolete.

Abdomen somewhat conical, clothed with reclinate bristly hairs, last three segments white pollinose on base, shining black apically, with both marginal and discal macrochaetae; the latter are sometimes asymmetrically placed. The piercer strongly developed, when unsheathed extends forward to second abdominal segment.

Legs black, middle tibiae with one bristle on the front side near the middle, hind tibiae sub-ciliate.

Wings whitish hyaline, costal spine inconspicuous, veins yellow. Third vein with two or three bristles near the base, all others bare. Posterior crossvein sinuous, nearer to bend of fourth than to small crossvein. Apical cell open, ending well before wing tip. Fourth vein nearly straight beyond bend, not distinctly appendiculate, but sometimes with a very short rudimentary stump at the bend. Calypteres white with a faint tawny tinge.

Described from three female specimens, collected at College Station, Texas, September, 1917, July, 1918, and October, 1921. (H. J. Reinhard). *Type*, a female, deposited in the U. S. National Museum, Washington, D. C. This species is evidently near *gladiatrix* Townsend, but differs in the color of the face, scutellum, abdomen, etc., the piercer is not as long, and discal bristles on all abdominal segments except the first.

Metachaeta cinerosa new species.

♂. Black, palpi, proboscis and base of third antennal segment, yellow. Front at vertex as broad as either eye, thinly gray pollinose, subshining, vitta opaque, brown, rather broad and extending around sides of ocellar triangle, the latter also gray pollinose and sub-shining. Ocellar bristles small, directed forward. Frontal bristles descending to tip of second antennal joint, usually two pairs of orbitals, the posterior pair sometimes very small. Cheeks, facial depression and sides of face gray pollinose. Antennae as long as face, third joint four or five times as long as second, convex on the front edge. Arista yellowish, short and thickened to the middle, densely clothed with short microscopic pubescence, the penultimate joint about as broad as long. Sides of face narrow, with a row of macrochaetae extending from the lowest frontal bristles to the lower corner of the eyes. Vibrissae large, cruciate, inserted on the oral margin, one or two bristles above each. Cheeks about one-third as wide as eye height. Proboscis short and fleshy, palpi slender, not thickened apically. Eyes apparently bare, but with a few short microscopic hairs.

Thorax thinly gray pollinose, dorsum sub-shining, with three pruinose vittae in front of the suture, the middle one extending postsuturally about half way to base of scutellum. The latter black, shining, bearing three pairs of marginal macrochaetae.

Abdomen elongate-ovate, shining black, narrow bases of second and third segments gray pollinose, all segments with marginal macrochaetae situated somewhat before the posterior border of the segments. No true discals present.

Wings hyaline, tinged with yellow at the base, costal spine strongly developed, veins yellow. The first vein bristly on basal half, third vein with bristles almost to small crossvein, all others bare. Posterior crossvein nearly straight, nearer to small crossvein than to bend of fourth, the latter without an appendage or fold. Last section of fifth vein more than one-half as long as the preceding section. Apical cell closed and long petiolate, the third vein ending near to wing tip. Calypteres white, with a tawny tinge.

Legs black, front tarsi considerably dilated, pulvilli and claws very short. Middle tibiae with a single bristle on the front side near the middle, hind tibiae not ciliate. Total length 4 mm.

Described from four male specimens collected at College Station, Texas, May, 1917, June, 1919, and March, 1921. (H. J. Reinhard). *Type*, a male, deposited in the U. S. National Museum, Washington, D. C. This species differs from *helymus* Walker, in having hyaline wings, pruinose vittae on thorax, no discal macrochaetae on abdomen, and the intermediate segments of the latter pollinose on base.

Hunting Rare Beetles and Bugs Above Clouds (Coleop.).

Howard Notman, of 136 Joralemon Street, Brooklyn, New York, although now possessing one of the largest collections of preserved insects in the Western Hemisphere, still continues his quest for rarer species (July, 1923). The accompanying "snap shot" caught the entomologist examining a carabus beetle, an almost extinct species which he recently found under a rock on the top of Altyn Mountain in Glacier National Park. Mr. Notman will remain in this Rocky Mountain region the rest of the summer adding to his collection which now numbers 75,000 insects. He has been gathering this collection since boyhood. He has 5,000 varieties of beetles. Instead of having a large library room as most men of his financial circumstances do, he has built one commodious room on the top floor of his Brooklyn house which he devotes to his collection. He keeps them in a score of long show cases. HOKE SMITH, St. Paul, Minnesota.

Two Fossil Hymenoptera from Florissant (Vespidae, Megachilidae).

By T. D. A. COCKERELL, Boulder, Colorado.

The wasp and bee now described, from the Miocene shales of Florissant, Colorado, belong to the Colorado Museum of Natural History, and were kindly placed in my hands for study by Director J. D. Figgins.

Palaeovespa relecta new species.

Length 17.5 mm.; anterior wing 10.7 mm.; first discoidal cell slightly over 5 mm.; length of marginal cell 3 mm.; prothoracic lobes not striate; abdomen broad at base as in *Vespa*. Head and thorax black; antennae stout, ferruginous, dark at extreme base; first two segments of abdomen pallid, with small lateral dark markings; segments 3 to 5 with broad dark bands, about as broad as the intervals between them, each with a broadly rounded lobiform extension posteriorly on each side, and at posterior middle a very minute point easily overlooked; apex dark. Wings clear, suffusedly somewhat dusky along upper margin; nervures light ferruginous; marginal cell produced and narrowly pointed as usual in genus; end of first discoidal not more oblique than in *Vespula;* second recurrent nervure ending much more than half way from first recurrent to end of second submarginal cell.

The following measurements are in microns: Second submarginal cell on first discoidal, 208, on second (third of many authors) discoidal, 560, from second recurrent to end, 320; width (depth) of marginal cell, 690; second submarginal on marginal, 384; third submarginal on marginal, 720.

This is an extremely interesting species, for several reasons. Among the species of *Palaeovespa,* it falls next to *P. gillettei* Ckll., but that has the abdomen black, with narrow light sutural bands, and differs in various details. The abdominal bands of *P. relecta* are lobed posteriorly as in the living *Vespula consobrina* Sauss.; in *V. germanica* Fabr. the lobes have become elongated and basally constricted, or cephaliform; in *V. vulgaris* L. they have become spots. The posterior median point so conspicuously developed in *Vespula* is a minute dentiform process on the hind margin of the bands of *P. relecta.* The slender apex of the marginal cell, and the position of the second recurrent nervure, place *P. relecta* in *Palaeovespa,* but *Vespula* is divided into two groups according to the position of the second recurrent. In true *Vespula,* with short malar space, the second recurrent ends about midway between the first and the end of the second submarginal cell. I have examined *V. occidentalis* Cress. (San Ignacio, New Mexico, at flowers of

plum, May 4.). *V. germanica* Fabr. (The Mount, Funchal, Madeira, Dec. 28), *V. vulgaris* L. (Winfrith, Dorset, England, Oct. 11), and *V. consobrina* Sauss. (Buford, Colo.). In Rohwer's *Dolichovespula,* which may be taken as a genus, not only is the malar space long, but the second recurrent is more than twice as far from the end of the second submarginal as from the first recurrent. I have before me *D. maculata* L. (Buford, Colo.). and *D. diabolica* Sauss. (Boulder, Colo., and Las Vegas, N. M.). With these structural differences, go others in nesting habits. In respect to the position of the recurrent nervures, *Dolichovespula* stands midway between *Vespula* and *Palaeovespa,* and therefore presumably represents the latest stage of evolution.

Heriades mersatus new species.

Length 6 mm.; anterior wing 3.8 mm.; base to stigma 2.2 mm.; width of head 1.5 mm., of abdomen not quite 2; length of abdomen 2.7 mm. Head and thorax black; abdomen pale reddish, darkened at apex and base; legs pale ferruginous; wings clear, nervures ferruginous; antennae stout; head and thorax closely and strongly punctured, as in modern *Heriades,* the punctures of thorax about 24 microns in diameter.

The following measurements are in microns: width of flagellum, 160; width (depth) of marginal cell, 304; straight section of basal nervure not greatly shorter than the curved (lower) section, the latter 416; length of marginal cell, 976; first intercubitus to end of marginal cell, 800; greatest length (diagonal) of first submarginal cell, 704; length of second submarginal, 624; second submarginal on marginal, 272; second recurrent before end of bulging second submarginal about 50 (as in the living *H. truncorum,* but in the fossil *H. halictinus* Ckll. the nervure is at end of cell). The first recurrent nervure joins second submarginal cell at distance from its base equal to about half intercubitus, as in *H. halictinus.* The nervulus, placed typically for the genus, is a very little basad of the basal nervure, and slightly arched outward. The first discoidal cell is 944 long.

Nearest to *H. halictinus* Ckll., among the Florissant fossils, but differently colored, and with different wing measurements. The lower section of basal nervure is not greatly curved.

This makes the sixth fossil *Heriades* from Florissant, while in the modern fauna of Colorado we know only three species. In Miocene times it appears that *Heriades* was prolific in species in the Rocky Mountain country, just as it is in South Africa today. Why it has become limited to a few types in modern Colorado we cannot conjecture, unless it may be that suitable nesting places are now less frequently available.

The Reason why Catocala Eggs are Occasionally Deposited on Plants upon which the Larva cannot Survive; and a New Variation (Lepid., Noctuidae).

By Ernst Schwarz, St. Louis, Missouri.

Twelve years ago Rowley (Entomological News, 1911, Vol. XXIII, p. 207.) collected from hickory a live egg of *Catocala ilia*. The egg hatched, the larva refused to feed on the hickory; but feasted on the burr oak. After mentioning that he had occasionally found on the shagbark hickory, dead eggs and dead larvae of what seemed to be this same species, Rowley inquires "Why are these eggs laid on a tree whose leaves the young larva cannot eat?"

For nearly eleven years the present writer has been investigating that problem. After conducting numerous experiments, all of which yielded the same results, the present writer thinks he has the solution to this problem which has long puzzled the naturalists. These experiments extended over a period of seven years; but, since the results of all experiments are similar, I shall confine my discussion to an experiment performed in 1921.

On August 16, 1921, I captured two females of *C. cara*. Each was placed in a two-pound paper bag and carried home. There each was confined in a large glass globe. In each globe I had previously placed a willow twig, a poplar twig and a hickory twig; willow is the natural food plant of this species.

The night beginning August 17th and ending August 18th both rested quietly on the willow, but no eggs were deposited. On the following night number one laid ten eggs and number two, eleven, all on the willow. The next night number one deposited twenty-one and number two, thirty eggs, all on the willow. Both seemed contented with their surroundings and continued to lay. By September 15, number one laid two eggs on the poplar; on the 16th, one on the poplar and two on the hickory. On the same night number two deposited one on the hickory. On the night of the 17th each rested on the

paper in the bottom of the cage. In the morning both were dead; but each had deposited an egg on the paper.

In previous years similar experiments were conducted with *C. ilia* Cram., a burr oak feeder; *C. titania* Dodge, a cockspur thorn (*Crataegus crus-galli* L.) feeder; and *C. palaeogama* Gn., a walnut feeder. The results were practically the same as that described above.

These experiments seem to permit of but one interpretation. As far as the catocala moths are concerned, ovipositing on other than the food plants of the larva is a function of old age. It is a sign of physical exhaustion. When the senses of sight and of smell have been so dulled by age that the moth has lost the power of discrimination then, and not until then, eggs are deposited on objects other than the food plant of the species. Fortunately for the species, this condition seldom occurs until after the bulk of the eggs have been deposited; hence it is not a handicap to the survival of the species.

A New Variation

Catocala hypolita, Strk. variety **walteri,** new variety.

Ground color light bluish, speckled lightly with black atoms. All markings very contrasting, heavy black, except the subterminal line, which is white. A heavy basal dash extends across the wing, terminating at inner angle between veins 1 and 2, only interrupted by the subterminal line. In all other respects as in the type. Expands 75 mm.

Described from one male and one female collected and reared by Mr. C. Walter. Type locality, Anaheim, California. *Type,* one male in the collection of the author and one female in that of Mr. Walter.

This variant rivals *semirelicta* in beauty.

The Bacot Memorial Fund.

In memory of Arthur William Bacot, whose death from typhus, while investigating the transmission of the disease by lice, was reported in the News for 1922, page 255, the Bacot Memorial Fund has been started in England to provide assistance to the authorities of the council schools in his home (Loughton) in furthering the study of natural history. (*Nature,* as reported in *Science,* lviii, p. 29).

A New Species of Agrilus from Kansas (Buprestidae, Coleop.).

By A. B. CHAMPLAIN and J. N. KNULL, Bureau of Plant Industry, Harrisburg, Pennsylvania.

The following species of *Agrilus*, found among some material sent to the writers for identification, through Prof. J. G. Sanders, is believed to be undescribed.

We are indebted to Prof. H. C. Fall for comparing it with the type of *Agrilus townsendi* Fall, and to Mr. C. A. Frost for examination of material.

Agrilus paramasculinus new species.

Form and size of *A. masculinus* Horn, dull cupreo-aeneous, each elytron with an indistinct vitta. Antennae reaching to the middle of the prothorax in the male, serrate from the fourth joint, head convex, front slightly strigate, vertex punctate, clypeus extremely broadly emarginate, becoming nearly truncate. Prothorax wider than long, sides strongly arcuate, sinuate near hind angles which are strongly carinate in both sexes, disk convex with two slight median depressions, lateral oblique depressions well marked, surface transversely strigate, densely pubescent laterally. Scutellum granulate, transversely carinate. Elytra dilate behind the middle, sinuate behind the humeri, apices rounded, serrulate, surface granulate-imbricate. Body beneath more shining than above, rather markedly pubescent, prosternal lobe emarginate, pygidium punctate, not carinate, abdomen densely but lightly punctate, tarsal claws deeply cleft, the inner portion turned inward, nearly, or quite touching that of the opposite side. Length 6 mm.

♂. Pro-, meso- and metasternum densely pubescent along median line, fore and middle tibiae mucronate on inner side, hind tibiae not mucronate.

♀. Ventral surface without any marked pubescence along median line, none of the tibiae mucronate.

According to Horn's key* this species would run to *A. masculinus* Horn, but it can easily be distinguished from this species by the faint vittate elytra and the much shorter first joint of hind tarsi.

Described from a series labeled "Kan. T. B. A.," in the Purdue University collection. *Type* in the Purdue University collection. The authors are indebted to Prof. J. J. Davis for the privilege of describing the species.

*Horn, G. H.—Trans. Amer. Ent. Soc., V. 18, p. 283—1891.

Notes on the Family Nemestrinidae (Diptera).

By FRANK M. HULL, Ohio State University, Columbus, Ohio.

The family Nemestrinidae comprises an unique group of flies rarely met with by most collectors and then only in its peculiar habitat—the dry and arid regions of the world. The North American representatives, of which there are now nine species in four genera, have been recorded from Central America, Mexico, western United States and Florida.

Neorhynchocephalus volaticus Williston.
Canadian Entomologist, 15, p. 71, 1883.

This species was exceedingly abundant in the vicinity of the Mississippi Agricultural and Mechanical College, during the month of July, 1922. The college is located near Starkville, Mississippi, in the north-eastern part of the state and this locality forms quite an extension of range for the species. It is a section of the state that becomes extremely dry in summer and very few flowers are then present. Pine-covered areas meet there with areas of decidous growth. There are no streams in this immediate region.

The writer found the species while collecting in tall, half-dried field grass. There was also an occasional shrubby bush and considerable half-grown goldenrod (*Solidago*). The flies were poised in the air from about a foot above the tops of the grass, to all depths within it. Apparently they were engaged in threading the mazes of the grass close to the earth. None were observed at rest upon the earth or vegetation. They flew slowly when not alarmed, at every few inches stopping to hover in the air, when they constantly emitted a very high-pitched hum or drone that is quite characteristic. The note appears to possess something of a ventriloquial effect, for the flies were not easy to discern even long after they were heard droning.

At nearly every step flies were flushed and often several might be seen at the same time. If approached too precipitously with the net they darted off very quickly, yet not so fast but that they might be followed with the eye for some sixty or seventy feet, when they apparently descended to earth again. In all, 32 males and 38 females were taken, during the period from July 21 to 29, 1922. A specimen was subsequently taken

by the writer at West Point, Mississippi (20 miles distant,) on Aug. 4, 1922, under similar conditions. Further, an examination of student collections showed three specimens collected a week to ten days before July 21, at Mississippi Agricultural and Mechanical College. In the collection of the college of the fall of 1921, were found three specimens taken in July of that year, one of them on July 7. The earliest record known from the state is of a specimen collected by Prof. R. W. Harned, July 16, 1909, at the college.

The flies were observed upon flowers in only a few instances; once on a small blue flower and twice on flowers of the *Rudbeckia* type. They were most active from two p. m. to four-thirty p. m., after which they became noticeably scarcer. No collecting was done in the forenoon. From the fact that they were quiet at noon and most active in the hottest part of the day, it is probable that they were quiet in the forenoon. They were observed on all sides of the college in situations similar to the one described. The breeding of the flies at the locality may be taken without question.

I have found the species in abundance on two other occasions. At Kingsville, Texas, June 6, 1921, nine specimens were collected from the greenish heads of a flower of the mint family. They were in a creek bed among considerable rank growth of vegetation. Hundreds of the flies were found at Raymondville, Texas, at mid-day (hottest part of the day), of June 29, 1921, over a large area of dense scrubby growth some four to five feet high and interspersed with cacti (*Opuntia*, etc.) and ebony trees in bloom. They were poising before the small greenish white flowers of white-bush (*Aloysia ligustrina* Small). About a dozen were collected.

The majority of the specimens were 10.5 to 11 mm., in length, exclusive of ovipositor (in the female). Three specimens were found to measure 12 to 13 mm., and two, only 9 mm. The ovipositor measured 2.5 mm.

The appearance of the insect is rendered characteristic by a rather thick clothing of a pale yellow, appressed pile, over the whole body, which hides the ground color, but which is generally denuded to some extent upon the abdomen. The ground color of the abdomen is shining light brown, the posterior margins of the segments usually show a

narrow black line, which, as a rule, is produced in the middle and anteriorly to form an uneven, black, median fascia on the dorsum of the abdomen. The pile of the abdomen is most adherent on the posterior margins of the segments producing a characteristic banded appearance.

Hirmoneura bradleyi Bequaert.

Journal New York Entomological Society, vol. 27, p. 311.

Three specimens of this species were collected by Mr. R. H. Painter, to whom the writer is indebted for the following notes. They were taken in Bee Creek Canyon, Austin, Texas, on May 19 and June 7, 1921. Bee Creek Canyon is two miles from Austin and in the dry limestone country of Edward's Plateau. Two of them, in copula, were taken at mountain cedar, *Sabina sabinoides* Small, and the third from the pink flowers of *Callicarpa americana* L. They were poising in the air and emitting the characteristic drone of the group. A fourth specimen was taken at Austin, Texas, on May 25, 1922, at mountain cedar.

H. bradleyi is characterized by its general dark reddish brown and smoky coloration and its longitudinally striped thorax.

Additional Syrphidae (Diptera) from North Carolina, with Descriptions of Two Supposed New Species.

By C. S. BRIMLEY, Division of Entomology, N. C. Dept. of Agriculture, Raleigh, North Carolina.

This list is supplementary to the one published by C. L. Metcalf, in the Elisha Mitchell Journal, Chapel Hill, N. C., December, 1916, in which he enumerates 128 species from this state, this list of fifteen more bringing the total number of Syrphidae known from the state to 143.

PIPIZA FESTIVA Meigen, Raleigh, March 21, 1921, April 7, 1923 CSB.

PIPIZA NIGRIPILOSA Will., Raleigh, August 2, 1921, CSB.

CHRYSOGASTER INFLATIFRONS Shannon, Four males, N. C., Morrison (Shannon, Proc. Ent. Soc. Wash, XVIII, 107.)

CHILOSIA SIMILIS Shannon, Raleigh, September 30, October 7, 1921, CSB.

SYRPHUS KNABI Shannon, Raleigh, March 28, 1908, August 5, 1918, late June, Black Mts., late May, 1910, F. Sherman and CSB.

XANTHOGRAMMA FLAVIPES Loew, Raleigh, September 13, 1922, one, CSB.

BRACHYOPA VACUA O. S., Raleigh, April 7, 1923, one on blossoms of black haw (*Viburnum prunifolium*). In this connection I may state that

I took 23 species of Syrphidae on the flowers of this shrub in four days' collecting this spring.

VOLUCELLA EVECTA Walker. Linville Falls, early June, 1920, one, FS.

ERISTALIS LATIFRONS Loew. Fayetteville, early June, 1921, one, CSB.

Helophilus anniae n. sp.

Face, antennae, arista, and lower part of front light yellow, the latter with yellow pile, narrower portion of front (between the eyes above) dark brown with dark pile. Thorax with two narrow submedian yellow stripes, and a somewhat broader one on each side, scutellum paler than thorax. Legs: front and middle femora dark brown for about basal two-thirds, yellow at apex, front and middle tibiae and tarsi mainly yellow, hind femora yellow on basal third, then abruptly black to apex, hind tibiae and tarsi black. Abdomen: second, third and fourth segments each with a pair of yellow spots, these wider externally and narrower internally, those of each pair widely separated, those of second and fourth segments broadly reaching the sides of those segments, those of third segment nearly or quite separated from the side of the segment by the ground color, a small yellow spot on the apex of fourth segment. Length about 11 mm.

One male taken at Raleigh, North Carolina, resting on foliage (bushes) near edge of small woodland stream, April 20, 1921 (*type*), and another male taken near the same place, May 9, 1921, both by myself. Type deposited in the United States National Museum, the paratype in the collection of the N. C. Dept. of Agric.

A female taken at Aberdeen, North Carolina, May 10, 1922, by R. W. Leiby appears to be the same species, the only differences being that it is slightly larger, the submedian stripes on the thorax are a trifle wider, there is no apical yellow spot on the fourth segment, and the pile on the front above the antennae is largely black, instead of yellow.

This species looks somewhat like a small *H. similis*, but differs from all species I know or could find descriptions of, in the following combination of characters,—wholly yellow face, antennae, and arista; three pairs of widely separated yellow spots on abdomen, and in the hind femora being yellow at base, and black in middle and apex. (Named for Mrs. C. S. (Annie) Brimley.)

TROPIDIA MAMMILLATA Loew, Raleigh, June 13, 1922, T. B. Mitchell.

Somula marivirginiae n. sp.

Resembles *S. decora* in general habitus, but differs in having the antennal prominence longer and more slender, in the possession of a

black facial stripe, and in the spots on the abdomen being smaller and transverse; the abdomen is not edged with yellow. Sexes practically alike in color.

Length about 16 mm. Antennal prominence slender, conical, about three times as long as its width at apex as seen from above (about twice as long, in *decora*), much less widened at base as seen from side so that the facial concavity is considerably higher up. Second antennal joint longer than in *decora*.

Coloration much as in *decora*, but differing as follows: the black on the dorsal surface of the antennal prominence is not almost or entirely surrounded by yellow at the base as in *decora*, but extends backward in undiminished width. On the underside of the prominence a narrow black stripe extends downward the whole length of the face to the oral opening; face yellow and cheeks black as in *decora*.

Arista concolorous with antennae, not much paler as in *decora*.

Thorax and scutellum about as in *decora*, with the same yellow humeri, but the patch of yellow hair on the mesopleurae is darker and less contrasting. Femora, tibiae, and metatarsi mainly yellow as in *decora*, except that the male has the middle portion of the hind femora dark brown; other portions of legs blackish or dusky.

Second, third and fourth dorsal abdominal segments each with a pair of yellow spots, these transverse and not oblique as in *decora*, somewhat smaller than in that species, all of them straight edged in front: fifth segment immaculate in both sexes. Abdomen not yellow-edged, the ground color extending to the sides. Venter blackish, the segments edged with yellow behind but not on the sides. The pile of the body about as in *decora*.

Type, a male collected at Raleigh, North Carolina, on blossoms of black haw, growing close to Walnut Creek, near where it enters Neuse River; *paratype*, female taken at same date and place. (Named for Mary-Virginia Dunn, my favorite niece.) Type deposited in National Museum, paratype in collection of N. C. Dept. of Agriculture.

CYNORHINA INTERSISTENS Walker, Linville Falls, early June, 1920 FS.
TEMNOSTOMA EXCENTRICUM Harris, Raleigh, May 8, 1922, CSB.
MICRODON AURULENTUS Fab., Raleigh, May 9, 1922, one, CSB.
MICRODON BOMBIFORMIS, Twnd, Raleigh, May 18, 1918, CSB.

Prof. and Mrs. T. D. A. Cockerell Escape from the Japanese Earthquake.

It is a matter of rejoicing among entomologists to learn that Professor and Mrs. T. D. A. Cockerell escaped from the Japanese earthquake. In *The Outlook* for October 3, 1923, Professor Cockerell relates his observations of the scene in Yokohama, as witnessed from the steamship *Empress of Australia* in that harbor.

ENTOMOLOGICAL NEWS

PHILADELPHIA, PA., NOVEMBER, 1923.

Give!

Elsewhere in this number of the NEWS, will be found an announcement of important gifts to the Division of Insects of the United States National Museum. During the present year reference has been made in these pages to various donations to museums on the other side of the Atlantic. It is especially gratifying to be able to record an equal instance of munificence in these United States. While there are exceptions to the statement that the great endowed or state-supported museums are the best resting places for private collections, the statement is generally true and we hope that many more American entomologists will follow Dr. Aldrich's example and in their life-time place their treasures where the latter may be freely accessible to their fellow-workers.

Notes and News.

ENTOMOLOGICAL GLEANINGS FROM ALL QUARTERS OF THE GLOBE

Two European Weevils established in North America (Coleoptera: Curculionidae).

Notaris bimaculatus Fabr. (wyomingensis Chittenden)

At the suggestion of Dr. Schwarz, the writer obtained a good series of the European *N. bimaculatus* for comparison with Chittenden's species. The two proved to be identical, and Dr. Chittenden who later studied the European set also pronounces his species a synonym. In addition to the type locality of *wyomingensis* (Cheyenne, Wyoming) the beetle has been found at Ft. Resolution, Mackenzie; Lone Deer, Montana; Volga, South Dakota; Spirit Lake and Lake Okoboji, Iowa; Madeline Island and Madison, Wisconsin.

The fact that nearly all the earlier records are from the west, while the later records become progressively more eastern, may indicate a west to east movement of dispersal, though nothing more than a surmise can be based on the scanty evidence now available.

Phytonomus rumicis Linn.

This species which is recorded as common on *Rumex and Polygonum amphibium* in Europe, was found in considerable numbers on a patch of *Polygonum* near Iowa City, Iowa, in May, 1917. Mr. F. S. Carr has also collected it at Edmonton, Alberta, (1919), and Mr. Sperry found one specimen in the stomach of an upland plover collected at Gronna, North Dakota, May 25, 1912. Dr. A Fleischer thinks it may

represent an American variety of *rumicis* on account of the somewhat brighter markings, but a separate name seems unnecessary. The better marked individuals of *rumicis* can be identified by the heavy black stripe on the elytra extending from the base backward along the suture and meeting a large transverse black spot or bar before the middle. Behind this bar the scales are whitish or at least distinctly brighter than the general surface color. The black markings are sometimes only vaguely indicated or even absent, but the patch of brighter colored scales behind the middle is present on all the specimens examined, and is apparently a distinctive feature. In the structure of the beak, antennae, and scales *rumicis* closely resembles *eximius* Lec., but the latter has the sides of the thorax more strongly arcuate and the body more convex.

Poorly marked individuals of *rumicis* might easily pass for *eximius*, and it is possible the two will be found mixed in collections.

L. L. BUCHANAN, U. S. Biological Survey, Washington, D. C.

The New Director of the Pennsylvania Bureau of Plant Industry. Charles H. Hadley, recently named by Secretary of Agriculture Frank P. Willits as the new director of the Pennsylvania Bureau of Plant Industry, took immediate charge of the work of the bureau on the day of his appointment, July 23, 1923.

Director Hadley is probably most widely known to agriculturists in Pennsylvania and in other parts of the country through his endeavors during the past three years as the federal entomologist in charge of all field operations of the joint Japanese Beetle project in southeastern Pennsylvania and in New Jersey. Entering the federal service in April, 1919, as a plant quarantine inspector at the Riverton, N. J., laboratory, later put in charge of the control work with 25 to 30 men under his direction and, in October, 1920, placed in complete charge of the project, his record of achievement in entomological work has been notable.

His early education was obtained in the Manual Training High School and the Polytechnic Preparatory School in Brooklyn, N. Y. In the fall of 1908, he entered Yale University and two years later transferred to the New Hampshire College of Agriculture and Mechanic Arts, receiving the degree of bachelor of science in 1912.

While a student at the New Hampshire state college he assisted in the insectary and laboratory and also engaged in experimental work in the field. For three years after graduation he held an assistantship in entomology in the college experiment station and in 1915 he went to Cornell University to pursue a year of study in advanced entomological subjects.

He is a member of the American Association for the Advancement of Science and has been a member of the American Association of Economic Entomologists since 1912. Other affiliations include Alpha Zeta, honorary agricultural society, and Sigma Xi, honorary scientific society. Among his most recent publications are: "The Japanese Beetle" (New Jersey Station circular), and "The Clover Leaf Weevil" (Cornell

Experiment Station bulletin). Other scientific contributions include, "The Lesser Migratory Locust" (Cornell); "Potato Insects" (Pennsylvania); "Arsenical Residues" (New Hampshire); "The Rhododendron Lace Bug," "The 17-Year Locust in New York," and "The Japanese Beetle Quarantine," in various issues of the *Journal of Economic Entomology*.

It is encouraging to those interested in the successful culmination of the Jap beetle fight that an agreement has been made between the Pennsylvania and the United States governments whereby Director Hadley will continue to oversee the general operations of the co-operative project during the next few months, while also giving his attention to the new duties in Pennsylvania. Part of his time will be given to the federal work in which he has been engaged and part to the duties of the Pennsylvania directorship. In his absence on federal duty, general supervision of the State work will be vested in Deputy Director Walter A. McCubbin.

A Magnificent Gift to the National Museum (Diptera).

The National Museum has recently received as a gift from Dr. J. M. Aldrich his private collection of Diptera. This collection was begun in 1890, and for 28 years received a good share of the owner's efforts; since he went to the National Museum in 1918 it has however received no additions. A recent inventory showed it to contain 44,610 pinned specimens and 4,145 species fully named; 534 of the latter were represented by type material. There are some hundreds of undescribed species; and as Dr. Aldrich collected for many years in the Pacific Coast and Rocky Mountain regions, his collection contains many named species not heretofore represented in the National collection.

Dr. Aldrich also donated to the Museum his card index of the literature of North American Diptera, begun in 1898 and now extending to about 70,000 references as nearly as can be estimated. With the exception of about 20 hours' work, this is all by the hand of the owner himself, and represents to a large extent his own conclusions from the literature rather than a mere compilation.

In a letter to his chief presenting the collection and index, Dr. Aldrich states that he was deterred from taking this action sooner because the salaries paid by the Museum are still on the scale established in 1882 (except for a temporary war bonus of $240), and he did not feel sure that he could continue permanently as one of the curators. Recently, however, under the reclassification act passed by the last Congress, the Museum staff have been assured of a new pay schedule approximating the requirements of the present time.

A Note on the Relationships of Pyrgotidae (Diptera).

Wiedemann, when he described the genus *Pyrgota*, placed it between the genera *Tetanocera* and *Platycephala*. In Williston's Manual and Aldrich's Catalogue it is placed in the family Ortalidae, but recently Hendel, Frey, and others have elevated it to family rank, the group now containing several other genera. There is a very evident difference of opinion amongst authors as to the relationships of the group. Hendel separates it widely from Conopidae while Frey associates it more closely with that family though indicating no definite relationship with it. It is my opinion that the families Conopidae and Pyrgotidae are more closely related than is evident from a survey of existing classifications and that they ought to be more closely associated in our lists, though to what other families they are both most closely related it is difficult to decide. The families, so far as we know, are parasitic in their larval stages, Conopidae in Hymenoptera, Pyrgotidae in Coleoptera and, in addition to this affinity of habit, in both families the ocelli are frequently absent or vestigial, which is nearly unique in related forms, and the mid coxae lack the chitinized prong on their upper outer side. This last character separates the families from nearly all those in Cyclorrhapha and sets the Pyrgotidae entirely apart from Ortalidae, all of which have the process very well developed.—J. R. MALLOCH, U. S. Biological Survey, Washington, D. C.

Entomological Literature

COMPILED BY E. T. CRESSON, JR., AND J. A. G. REHN.

Under the above head it is intended to note papers received at the Academy of Natural Sciences, of Philadelphia, pertaining to the Entomology of the Americas (North and South), including Arachnida and Myriopoda. Articles irrelevant to American entomology will not be noted; but contributions to anatomy, physiology and embryology of insects, however, whether relating to American or exotic species, will be recorded.

The numbers in **Heavy-Faced Type** refer to the journals, as numbered in the following list, in which the papers are published.

All continued papers, with few exceptions, are recorded only at their first installments.

The records of papers containing new genera or species occurring north of Mexico are grouped at the end of their respective Orders.

For records of Economic Literature, see the Experiment Station Record, Office of Experiment Stations, Washington. Also Review of Applied Entomology, Series A, London. For records of papers on Medical Entomology, see Review of Applied Entomology, Series B.

The titles occurring in the Entomological News are not listed.

2—Transactions of The American Entomological Society, Philadelphia. **4**—Canadian Entomologist, Guelph, Canada. **5**—Psyche, Cambridge, Mass. **6**—Journal of The New York Entomological Society. **7**—Annals of The Entomological Society of America, Columbus, Ohio. **9**—The Entomologist, London. **11**—Annals and Magazine of Natural History, London. **12**—Journal of Economic

Entomology, Concord, N. H. **20**—Bulletin de la Societe Entomolgique de France, Paris. **21**—The Entomologist's Record, London. **22**—Bulletin of Entomological Research, London. **33**—Annales de la Societe Entomologique de Belgique, Brussels. **34**—Bulletin de la Societe Entomologique de Belgique, Brussels. **35**—Proceedings of the South London Entomological & Natural History Society, London. **36**—Transactions of the Entomological Society of London. **37**—Proceedings of the Hawaiian Entomological Society. **39**—The Florida Entomologist, Gainesville, Florida. **45**—Zeitschrift fur wissenschaftliche Insektenbiologie, Berlin. **52**—Zoologischer Anzeiger, Leipzig. **59**—Journal of Agricultural Research, Washington, D. C. **61**—Proceedings of the California Academy of Sciences, San Francisco. **67**—Le Naturaliste Canadien, Quebec. **68**—Science, Garrison on the Hudson, N. Y. **78**—Bulletin Biologique de la France et de la Belgique, Paris. **82**—The Ohio Journal of Science, Columbus, Ohio. **85**—The Journal of Experimental Zoology, Philadelphia. **89**—Zoologische Jahrbucher, Jena. **91**—The Scientific Monthly, Lancaster, Pa. **99**—Bulletin du Museum National d'Histoire Naturelle, Paris. **100**—Biological Bulletin of the Marine Biological Laboratory, Woods Hole, Mass. **103**—Biologisches Centralblatt, Leipzig. **114**—Entomologische Runschau, Stuttgart. **115**—Societas Entomologica, Stuttgart. **116**—Entomologische Zeitschrift, Frankfurt a. M. **138**—American Museum Novitates, New York. **139**—Bulletin of the Southern California Academy of Sciences, Los Angeles. **149**—Deutche Entomologische Zeitschrift "Iris," Dresden.

GENERAL. Biener, A.—Die kriegsgefangenschaft vom standpunkte des entomologen. **116** xxxvii, 17-18. **Brues, C. T.**—Ancient insects; fossils in amber and other deposits. **91,** xvii, 289-304. **Bunnet, E. J.**—Some notes on the natural history of Manitoba. **35,** 1922, 76-89. **Chapais, J. C.**—Insectes a respecter. **67,** 1, 25-30. **Crampton, G. C.**—A phylogenetic comparison of the maxillae throughout the orders of insects. **6,** xxxi, 77-107. **Ferris, G. F.**—Entomological illustrations. **68,** lviii, 265-66. **Fremlin, H. S.**—The growing importance of entomology. **21,** xxxv, 136-39. **Hartley, E. A.**—A useful cage for the rearing of small insects on growing plants. **82,** xxiii, 201-3. **Illingworth, J. F.**—Insect fauna of hen manure. **37,** v, 270-74. **Lameere, A.**—On the wing-venation of insects. **5,** xxx, 123-32. **Monchaux, D. de**—Sur l'insuffisance relative de certains moyens de protection des insectes; a propos d'une note d A. Chappellier sur le regime alimentaire des Corbeaux Freux. **20,** 1923, 148-9. **Prell, H.**—Uber eine "fremddienliche zweckmassigkeit" bei insekten und ihre kausale analyse. **103,** xliii, 432-9. **Thompson, W. R.**—A criticism of the "sequence" theory of parasitic control. **7,** xvi, 115-28.

Williams, C. B.—Records and problems of insect migration. **36,** 1923, 207-33.

ANATOMY, PHYSIOLOGY, ETC.—Bridges & Morgan—The third-chromosome group of mutant characters of Drosophila melanogaster. (Carnegie Inst. Wash., Pub. No. 327, 251 pp.) **Metz, Moses, & Mason**—Genetic studies on Drosophila virilis with considerations on the genetics of other species of Drosophila. (Carnegie Inst. Wash. Pub. No. 238, 94 pp.)

ARACHNIDA AND MYRIOPODA.—Provancher—Les merveilles de la création dans les choses les moins remarques. **67,** 1, 9-18. **Simon, E.**—Note sur la synonymie et la distribution de deux especes d'araignees exotiques. **99,** 1923, 221. **Valadez, S. M.**—Ensayo de una monografia sobre ixodidos mexicanos vulgo garrapatas. (Mem. Soc. "Alzate," xli, 197-216.) **Webster, R. L.**—Scorpions in North Dakota. **68,** lviii, 248. **Weiss, S.**—Untersuchungen uber die lunge und die atmung der Spinnen. **89,** xxxix, Allg. u Zool. 535-44.

Chamberlin, R. V.—New and little known pseudoscorpions, principally from the islands and adjacent shores of the Gulf of California. On chilopods and diplopods from the islands in the Gulf of California. A revision of the genus Anisembia, with description of a n. sp. from the Gulf of California. **61,** xii, 341-51; 353-87; 389-407.

THE SMALLER ORDERS OF INSECTA. Brethes, J.—Un Dorypteryx nouveau de Buenos-Ayres. **20,** 1923, 117-18. **Lestage, J. A.**—La persistance des tracheo-branches larvaires chez les Perlides adultes. **34,** v, 63-78. **Lucas, W. J.**—Labium (second maxillae) of the Paraneuroptera (Odonata). **35,** 1922, 57-63. **Muir, F.**—(See under Diptera.) **Smith, R. C.**—The life histories and stages of some Hemerobiids and allied species. **7,** xvi, 129-42. **Waterson, J.**—On the Mallophaga of the Shackelton-Rowett expedition, 1921-1922. **36,** 1923, 288-90. **Watson, J. R.**—The proper name and distribution of the Florida flower thrips. **39,** vii, 9-11.

Dodds, G. S.—Mayflies from Colorado. Descriptions of certain species and notes on others. **2,** xlix, 93-114.

ORTHOPTERA. Buddenbrock u. Rohr.—Die atmung von Dixippus morosus. (Zeit. f. Allgem. Phys., xx, 111-60.) **Uvarov, B. P.**—Notes on locusts of economic importance, with some new data on the periodicity of locust invasion. **22,** xiv, 31-39.

Hebard, M.—The Dermaptera and Orthoptera of the Gulf of California expedition. **61,** xi, 319-40.

HEMIPTERA. Barber, G. W.—Notes on a New England aradid. **5,** xxx, 120-22. **Bergoth, E.**—On the systematic position of the genera Dismegistus and Parastrachia. **33,** lxiii, 70-72. **Brain, C. K.**—A preliminary report of the intracellular symbionts of South

African Coccidae. (Ann. Univ. Stellenbosch, i, Sec. A, No. 11, 48 pp.) **Britton, W. E.**—Swarms of aphids. **12**, xvi, 395. **Funkhouser, W. D.**—Walker's species of Membracidae from U. S. and Canada. **7**, xvi, 97-114. **Garman, P.**—Notes on the life history of Clastoptera obtusa and Lepyronia quadrangularis. **7**, xvi, 153-64. **Hargitt, C. W.**—The digestive system of the periodical cicada. II. Physiology of the adult insect. **100**, xlv, 200-12. **Hickernell, L. M.**—The digestive system of the periodical cicada, Tibicen septendecim. III. Morphology of the system in the nymph. **100**, xlv, 213-21. **Mason, A. C.**—Is the adult condition of an aphid determined when it is born? **39**, vii, 1-7. **Muir, F.**—On the classification of the Fulgoroidea. **37**, v, 205-48.

Fracker, S. B.—A review of the N. Am. Coreini. **7**, xvi, 165-75.

LEPIDOPTERA. Adkin, R.—The lepidopterous enemies of Man. With special reference to species that occur in Britain. **35**, 1922, 26-47. **Ainslie, G. G.**—Striped sod webworm, Crambus mutabilis. (Jour. Agr. Res., Wash., xxiv, 399-414.) **Bang-Haas, O.**—Die typen der gattung Agrotis der collection Staudinger u. Bang-Haas in Dresden-Blasewitz. **149**, xxxvi 31-9. **Barnes & Benjamin.**—Notes on the authorship of certain names (Phalaenidae.) **4**, lv, 198. **Butler, A. G.**—Melanism in lepidoptera. **9**, 1923, 187-88. **Butler & Sevastopulo.**—Variation in lepidoptera. **9**, 1923, 215-6. **Comstock, J. A.**—Studies in Pacific coast L. Butterflies of California. **139**, 69; 75. **Goldschmidt u. Pariser.**—Triploide intersexe bei schmetterlingen. **103**, xliii, 446-52. **Grosvenor, T. H. L.**—Notes on the genus Zygaena. **35**. 1922, 64-72. **Huggins, H. C.**—Variation in lepidoptera. .**9**, 1923, 188-90. **Krueger, E.**—Kurze ubersicht uber die Morphiden Columbiens. **114**, xl, 31-2. **Lathy, P. I.**—Further notes on the Castniinae in the collection of Madame Gaston Fournier. **11**, xii, 223-7. **Lindsey, A. W.**—The egg and larva of Hesperia juba. (Dennison Univ. Bull., xx, 121-26.) **McDunnough, J.**—Extended pupal duration. **4**, lv, 198. **Moreau, E.**—Un Papilio nouveau de la Guyane francaise. **20**, 1923, 144. **Pittioni, B.**—Noctuidenfang an "naturlichen" koder. **116**, xxvii, 21-2. **Skinner & Williams**—On the male genitalia of the Hesperidae of N. Am. III. **2**, xlix, 129-53. **Stirling, F.**—Southern migration of butterflies. **39**, vii, 8-9. **Turati, E.**—Cinque anni di ricerche nell 'appennino modenese. (Note di lepidopterologia). (Atti Soc. Ital. Sc. Nat., Milano, lviii, 4-74.) **Tillyard, R. J.**—On the mouth parts of the Micropterygoidea. **36**, 1923, 181-206. **Watkins, H. T. G.**—Notes on the butterflies of the Banks collection. **9**, 1923, 204-9. **Wynne, A. S.**—Melanism in lepidoptera. **9**, 1923, 216.

Barnes & Benjamin—Noctuidae of the Gulf of California expedition. **61**, xii, 423-24. **Braun, A. F.**—Microlepidoptera: notes and n. sps. **2**, xlix, 115-27.

DIPTERA. Harris, R. G.—Occurrence, life-cycle, and maintenance, under artificial conditions of Miastor. **5,** xxx, 95-101. **Herve-Bazin, J.**—Note synonymiques sur quelques Lathyrophthalmus. **99,** 1923, 173-4. **Kreisel, C.**—Untersuchungen uber den einfluss von sauerstoff, kohlensaure und neutralsalzen auf Culicidenlarven und puppen. **89,** xxxix, Allg. u. Zool., 459-534. **Mast, S. O.**—Photic orientation in insects with special reference to the drone fly, Eristalis tenax and the robber-fly, Erax rufibarbis. **85,** xxxviii, 109-205. **Muir, F.**—On the homology between the genitalia of some diptera and those of Merope tuber. **36,** 1923, 176-80. **Rabaud, E.**—Sur le comportement de Scatophaga stercoraria. **20,** 1923, 167-8. **Seguy, E.**—Etude sur le Muscina stabulans. **99,** 1923, 310-17. **Simmons, P.**—A house fly plague in the American Expeditionary Force, France. **12,** xvi, 357-63. **Surcouf, J.**—Deuxieme note sur les conditions biologiques du Stomoxys calcitrans. **99,** 1923, 168-72. **Thompson, W. R.**—Recherches sur la biologie des dipteres parasites. **78,** lvii, 174-237.

Curran, C. H.—Undescribed Canadian Dolichopodidae, with key to Chrysotimus. Change of name. **4,** lv, 190-92; 198. **Curran, C. H.**—Two undescribed syrphid flies from New England. (Occ. Pap. Boston Soc. N. H., v, 65-7.) **Hine, J. S.**—Alaskan species of D. of the genus Helophilus, with notes on others. Some notes on American Tabanidae, with the description of a n. sp. from Africa. **82,** xxiii, 192-200; 204-6. **Malloch, J. R.**—Anthomyiidae and Lonchaeidae from the Gulf of California expedition. **61,** xii, 425-28. **Melander, A. L.**—The genus Cyrtopogon (Asilidae). **5,** xxx, 102-119.

COLEOPTERA. Aurivillius, C.—Coleopterorum catalogus. Pars 74: Cerambycidae: Lamiinae II. 323-704. **Carr, F. S.**—Additions to the list of the C. of Northern Alberta. **4,** lv, 196-7. **Chittenden, F. H.**—The Australian tomato weevil introduced in the south. (U. S. Dept. Agr., Dept. Circ. 282.) **Davidson, W. M.**—Biology of Scymnus nubes. **2,** xlix, 155-63. **Desbordes, H.**—Description d'un Saprinus nouveau du Brasil. **20,** 1923, 151-2. **d'Orchymont, A.**—Les Hydraena Americaines. **33,** lxiii, 33-44. **Portevin, M. G.**—Revision des Necrophorini du globe. **99,** 1923, 64-71, (cont.) **Schmidt, A.**—Das tierreich. Lief. 45. Coleoptera: Aphodiinae. 614 pp. **Sloane, T. G.**—The classification of the family Carabidae. **36,** 1923, 234-50. **Stichel, W.**—Zur phylogenesis eines geologische jungen formenkreises der kaefer, der Ditominen. **45,** xviii, 145-62 (cont.) **Stickney, F. S.**—The head-capsule of coleoptera. (Ill. Biol. Mon., viii, No. 1.)

Blaisdell, F. E.—The Melyridae of the Gulf of California expedition. **61,** xii, 409-21. **Nicolay & Weiss.**—The group Traches in N. Am. Pt. II. The genus Brachys, **6,** xxxi, 59-76.

HYMENOPTERA. Cockerell, T. D. A.—Descriptions and records of bees. XCVIII. **11,** xii, 238-47. **Forel, A.**—Le monde social

des fourmis. V. Moeurs specialisees. Epilogue: les fourmis, les termites et l'homme. 173 pp. 1923. **Heikertinger, F.**—Zur metoken myrmekoidie. **45,** xviii, 163-78. **Hill, C. C.**—Platygaster vernalis, an important parasite of the hessian fly. **59,** xxv, 31-42. **Howes, P. G.**—Life and habits of the common mud wasp (Sceliphron). (Nature Mag., ii, 197-200.) **Lichtenstein et Rabaud**—Le comportement des "polysphincta" ichneumonides parasites des araignees. (Trav. Inst. Zool. Univ. Montpellier, (2), Mem. 38.) **Santschi, F.**—Pheidole et quelques autres fourmis neotropiques. **33,** lxiii, 45-69. **Schnelle, H.**—Uber den feineren bau des fettkorpers der honigbiene. **52,** lvii, 172-79. **Semichon, L.**—Sur les differences specifiques dans les stigmates des larves de Vespa. **20,** 1923, 170-1. **Stager, R.**—Gibt es insekten, die von ameisen nicht verzehrt werden? **115,** xxxviii, 33-5.

Bradley & Bequaert—A new Dasymutilla from Arizona. **138,** No. 82. **Fox, C. L.**—The Bembicinae from the expedition to the Gulf of California. **61,** xii, 429-36. **MacGillivray, A. D.**—Quarter century of species of Tenthredo. **6,** xxxi, 107-16. **Sandhouse, G.**—The bee genus Dialictus. **4,** lv, 193-95. **Waterston, J.**—Notes on parasitic H. **22,** xiv, 103-9.

SPECIAL NOTICES.

Bulletin of the Lloyd Library, Cincinnati, Ohio. Entomological Series. The third bulletin of this series has recently appeared, and treats of the morphology, anatomy, and embryology of Nemoura (Plecoptera). The three bulletins contain over 250 pages and many illustrations. No. 1 was on the Biology of North American caddis-fly larvae; 2, treated of the biology of some of our North American species of May flies. **Manual of Entomology** by H. Maxwell Lefroy. Ed. Arnold & Co., London. 541 pp., ill., 1923. A copy of this work has just been received. A review of the same was published in the Entomologist, 1923, p. 190. **Polskie Pismo Entomologiczne.** Bulletin entomologique de la Pologne, Lwow (Lemberg). The first number of this new publication has been received, thus announcing another new European entomological society, and adding another member to the entomological bibliographical community. This number contains 24 pages, eight articles, pertaining to the palaeartic entomological fauna, mostly of Poland. **Fabre, J. H., The Life of the Scorpion.** Translated from the French series of Souvenirs Entomologiques, and completes the translation into English of this series. Published by Dodd, Mead & Co., New York, 1923, 344 pp.

The reader will find this book of exceptional interest. Fabre here tells of much that is not generally known about the life and habits of these intolerated animals in his usual entertaining manner. $2.50.

EXCHANGES

This column is intended only for wants and exchanges, not for advertisements of goods for sale. Notices not exceeding three lines free to subscribers.

These notices are continued as long as our limited space will allow; the new ones are added at the end of the column, and only when necessary those at the top (being longest in) are discontinued.

Syrphidae from all parts of North America wanted. Monographing the family.—C. H. Curran, Department of Entomology, University of Kansas, Lawrence, Kansas.

Will collect in all orders except Lepidoptera, in exchange for Cerambycidae (longicorn beetles) and Pentatomidae (stink-bugs). G. Chagnon, P. O. Box 521, Montreal, Canada.

I will collect Coleoptera and Lepidoptera in southwest Arkansas for those so interested.—Miss Louise Knobel, 417 West 2nd Avenue, Hope, Arkansas.

Correspondence solicited from anyone desiring general collections of insects, to be made in Costa Rica. Austin Smith, Apartado 412, San José, Costa Rica.

Wanted—Am working on a Revision of the Buprestidae of the West Indies and would like to examine any material in this family from that region. W. S. Fisher, U. S. National Museum, Washington, D. C.

For Exchange—A large number of Papilio Turnus, P. Cresphontes and P. Ajax pupae, or the same specimens in papers, for other pupae or Lepidoptera. Carl Selinger, 4419 Dover St., Chicago, Ill.

Coleoptera for exchange—Cicin. generosa, hirticollis, modesta, sexguttata, 12-punctata, Saperda populnea, Uro. fasciata, Donacia subtilis, palmata, texana-minor, biimpressa, refuscens. Ernest Baylis, 5011 Saul St., Philadelphia, Pa.

Endomychidae. I desire to purchase representatives of this family from any part of the world. Particularly desire specimens from the western and southwestern part of the U. S. L. B. Walton, Kenyon College, Gambier, Ohio.

Buprestidae, Cleridae and **Carabinae** wanted from U. S. or Buprestidae of the world. Will collect insects of any group (except Lepidoptera) in exchange or pay cash. Alan S. Nicolay, 416a Grand Ave., Brooklyn, New York.

Lepidoptera. Hesperiidae (Skipper-butterflies). Will purchase, exchange or name specimens. North or South America. Pamphila comma group particularly desired. Henry Skinner and R. C. Williams, Jr., Address Academy of Natural Sciences, Logan Square, Philadelphia, Pa.

Lepidoptera-Noctuidae. Will purchase or exchange moths of this family for western lepidoptera. Chas. A. Hill, P. O. Box 653, Glendale, Cal.

Wanted—Ants from all portions of the United States for determination or exchange. Will also exchange other insects for ants. M. R. Smith, Assistant Entomologist, State Plant Board, A. and M. College, Miss.

Wanted in exchange or cash 1000 Precis orithya ♂, Precis isoratia ♂, Precis mevaria ♂. A. F. Porter, 104 W. Broadway, Decorah, Iowa.

Cynipidae. Galls and bred wasps wanted to determine or in exchange. Alfred C. Kinsey, Indiana University, Bloomington, Indiana.

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Of Interest to Specialists.

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If you are interested and desire to avail yourself of this system, advise us of the order or orders in which you wish to secure publications, together with a remittance of $1.00 or more as a deposit, and all papers on such orders will be mailed to you directly on their receipt from the printer. These will be charged against your amount of deposit at 25 per cent. discount from the list or general sale price. Any balance to your credit is returnable on demand should you not care to continue the subscription.

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